

September 22, 2014

**Bryan Grusz**

**SG Building Group**

11400 SE 8<sup>TH</sup> Street, suite #415

Bellevue, WA 98004

**425.417.0053**

[www.sgbuilt.com](http://www.sgbuilt.com)

Site: 401 Slater St.  
Kirkland, WA 98033

Dear Kim:

Thank you for requesting my services. On September 18th, 2014, I visited the site located at 401 Slater St in Kirkland, WA, to perform a Visual Risk Assessment (VRA) for all significant\* trees growing on the property. The information gathered is included in this report and is necessary to prepare a Tree Retention Plan required by the city of Kirkland prior to site development.

Also included are the City of Kirkland Tree Protection Specifications and Fencing Detail, necessary for submittal.

In summary:

- The site has 47 significant trees \*<sup>1</sup> (149 Tree credits)
- Based on the City of Kirkland's tree density requirement of 30 tree credits/acre this 21,119 square foot lot requires 15 tree credits.
- Limits of disturbance are noted on the Tree Inventory Spreadsheet and are specific to each tree based on species, tolerance to construction and site conditions.

I have included a detailed report of my findings. If you have any questions please call me. I can be reached on my cell phone: 425.890.3808 or by email: [sprince202@aol.com](mailto:sprince202@aol.com).

Warm regards,



Susan Prince  
Creative Landscape Solutions  
ISA Certified Arborist: PN #1418A  
TRACE Certified Arborist: #418  
17518 NE 119<sup>th</sup> Way  
Redmond, WA 98052

\* Per city of Kirkland Municipal Code, a significant tree is one whose Diameter at Breast Height (DBH) is 6+ or greater

<sup>1</sup>This number includes 22 Clumps of Willows requested by Tom Early, City Urban Forester to be counted as a tree+

## Assignment

I was contacted by Brian Grusz who requested I perform a Visual risk assessment and complete a Tree Protection Plan for the site identified above.

## Personal qualifications, scope of work and methodology

My examination was limited to a visual one, and did not involve any root excavation, trunk or limb coring, or any soil testing. To evaluate the trees and prepare the report, I drew on my formal college education in botany, preparation and training used to obtain my ISA certification in addition to my certification as a Tree Risk Assessor. I have been an ISA Certified Arborist for over fifteen years and have been TRACE/TRAQ certified for four years.

I followed protocol delineated by the International Society of Arboriculture (ISA) for Visual Risk Assessment (VRA). By doing so, I am examining each tree independently as well as collectively as groups or stands of trees provide stability and can lower risk of independent tree failure. This scientific process examines tree health (e.g. size, vigor, insect and disease process) as well as site conditions (soil moisture and composition, amount of impervious surfaces surrounding the tree etc.)

## Introduction:

Identifying and managing the risks associated with trees is still largely a subjective process. Since the exact nature of tree failures remains largely unknown, our ability as scientists and arborists to predict which trees will fail and in what fashion remains limited. As currently practiced, the science of hazard tree evaluation involves examining a tree for structural defects, including genetic problems, those caused by the local environmental that the tree grows in and those attributed to man (pruning etc.).

The assessment process involves evaluating three components: 1) a tree with the potential to fail, 2) an environment that may contribute to that failure, and 3) a person or object that would be injured or damaged (the target). By definition a defective tree cannot be considered hazardous without the presence of a target.

All trees have a finite life-span though it is not pre-programmed internally in the same manner as annual plantings. As trees age they are less able to compartmentalize structural damage following injury from insects, disease or pruning. Trees in urban settings have a shorter life span than trees grown in an undisturbed habitat.

Different species of trees grow differently. Evergreen trees have a reputation of growing slowly and defensively. These trees allocate a high proportion of their resources to defending themselves from pathogens, parasites and wounds. As a rule, trees with this type of growth tend to be long lived. Though like all other living things, they have a fairly predictable life span. Examples of this type of tree include the northwest *Pseudotsuga menziesii* - Douglas fir, and *Thuja plicata* - Western red cedar.

Deciduous trees are trees that annually shed leaves or needles. These trees have a tendency to grow quickly and try to outgrow problems associated with insects, disease and wounds. They allocate a relatively small portion of their internal resources to defense and rely instead upon an ability to grow more quickly than the pathogens which infect them. However, as these trees age, their growth rate declines and the normal problems associated with decay begins to catch up and compromise the tree's structural integrity. Examples of this type of tree include *Salix*, *Populus* and *Alnus*.

Knowledge of the growth and failure patterns of individual tree species is critical to effective hazard analysis. Species vary widely in their rates of failure. The hazard tree evaluation rating system used by most arborists was developed by the Colorado Urban Forest Council and recognizes this variation in species failure and includes a species component as part of the overall hazard evaluation.

**Site Observations:**

The site is located west of I405 and south of 85<sup>th</sup> Ave. The site has a large grassy field that slopes upward to the east. There is an existing home on the property with a treed native area in the back

**Method's used to determine tree location and tree health:**

Trees were identified previously by numbered aluminum tags attached to the western side of the tree. All of the trees on site were examined using the Matheny and Clark<sup>1</sup> criteria for determining the potential hazard of trees in an urban environment as well as the Tree Risk Assessment in Urban Areas and The Urban/Rural Interface by Julian Dunster<sup>2</sup>.

The tree diameter was measured using an aluminum diameter tape measure. Tree canopy was approximately by pacing off the area.

**Spreadsheet Legend:**

Tree tag #: 0 0 ..Numbered aluminum tags attached to the trees in the field\*<sup>1</sup>

Survey #: 0 0 ..Numbers assigned to trees on the survey map

DBH: 0 0 .. Diameter of the tree measured at 42+above grade

Dripline Radius: 0 0 ..Measurement in feet of the tree canopy from tree trunk to outermost branch tip

Health: 0 0 ..A measurement of overall tree vigor and vitality rated as excellent, good, fair or poor based on an assessment of crown density, leaf color and size, active callusing, shoot growth rate, extent of crown dieback, cambium layer health, and tree age

- Excellent: Tree is an ideal specimen for the species with no obvious flaws
- Good: Tree has minimal structural or situational defects
- Fair: Tree has structural or health issues that predispose it to failure if further stressed
- Poor: Tree has significant structural and/or health issues. It is exempt from total tree count.

Defects/Concerns: 0 0 ..a measure of the tree's structural stability and failure potential and rated as good, fair or poor based on assessment of specific structural features, eg., decay, conks, co-dominant trunks, included bark, abnormal lean, one-sided canopy, history of failure, prior construction impact, pruning history, etc.

**Proposed action:**

- Retain
- Remove due to viability
- Remove due to planned development (tree is otherwise healthy)

Limits of disturbance: 0 0 ..The area surrounding the tree that defines the area that surrounds the trunk that cannot be encroached upon during construction. This may be a multiple of the trunk diameter (1 -1.5 times the trunk diameter converted to feet.) or it may be related to the width of the canopy. It is always determined by tree species and environment and is up to the discretion of the ISA Certified Arborist to determine

Tree Density Requirement: 0 0 ..30 tree credits per acre, not including trees in the city easement (street trees)

**Tree Density for Existing Significant Trees**  
**(Credits per minimum diameter**  
**– DBH)**

DBH	Tree Credits	DBH	Tree Credits	DBH	Tree Credits
3 . 5"	0.5				
6 . 10"	1	24"	8	38"	15
12"	2	26"	9	40"	16
14"	3	28"	10	42"	17
16"	4	30"	11	44"	18
18"	5	32"	12	46"	19
20"	6	34"	13	48"	20
22"	7	36"	14	50"	21

Example: a 7,200-square-foot lot would need five (5) tree credits ( $7,200/43,560 = 0.165 \times 30 = (4.9)$  or five (5)). The density for the lot could be met with one (1) existing 16-inch tree and one (1) existing 6-inch tree on site.

Species ID:õ õ ..Spreadsheet contains common names of trees which correspond to scientific names as follows:

- Apple: *Malus sp.*
- American sycamore: *Plantanus occidentalis*
- Austrian pine: *Pinus nigra*
- Bigleaf maple: *Acer macrophyllum*
- Birch: *Betula nigra*
- Bitter Cherry: *Prunus emarginata*
- Blue atlas cedar: *Cedrus atlantica 'Glauc'*
- Cedar: *Thuja plicata*
- Cherry: *Prunus sp.*
- Dawn redwood: *Chamaecyparis nootkatensis*
- Deodora cedar: *Cedrus deodara*
- Colorado blue spruce: *Picea pungens*
- Cottonwood: *Populus trichocarpa*
- Dogwood: *Cornus nuttallii*
- Douglas fir: *Pseudotsuga menziesii*
- English laurel: *Prunus laurocerasus*
- Filbert: *Corylus avellana var.*
- Grand fir: *Abies grandis*
- Hemlock: *Tsuga hetrophylla*
- Holly: *Ilex aquifolium*
- Japanese maple: *Acer palmatum*
- Leylandii cypress: *Cupressocyparis leylandii*
- Lodgepole pine: *Pinus contorta*
- Mountain ash: *Sorbus americana*
- Nobel fir: *Abies procera*
- Pear: *Pyrus sp.*
- Plum: *Prunus*
- Red Alder: *Alnus rubra*
- Red maple: *Acer rubrum*
- Walnut: *Juglans sp.*
- Western red cedar: *Thuja plicata*
- Weeping Alaska cedar: *Metasequoia glyptostrobides*
- White fir: *Abies concolor*
- White pine: *Pinus strobus*

## Specific Tree Observations:

#	Tag #	Species	DBH (inches)	Dripline (feet)	Comments	Health	Limits of Disturbance	Tree Credits
1	451	<i>Apple</i>	3/5/2/8/8/6=14	13	Dead wood, leaders with included bark and decay typical of species some from poor pruning	OK	14	3
2	458	<i>Leylandii cypress</i>	8	8	Typical of species	Excellent	8	1
3	459	<i>Leylandii cypress</i>	6	8	Typical of species	Excellent	6	1
4	460	<i>Leylandii cypress</i>	6	8	Typical of species	Excellent	6	1
5	461	<i>Western red cedar</i>	41	20	Column of decay, can probe 12+into trunk on the north side	Good	30	16.5
6	462	<i>Leylandii cypress</i>	11	8	Typical of species	Excellent	10	1.5
7	463	<i>Leylandii cypress</i>	9	8	Typical of species	Excellent	8	1
8	464	<i>Leylandii cypress</i>	5/3=6	8	Typical of species	Excellent	8	1
9	465	<i>Leylandii cypress</i>	7.5	8	Typical of species	Excellent	8	1
10	466	<i>Leylandii cypress</i>	10	6	Typical of species	Excellent	8	1
11	63	<i>Emerald green</i>	6	4	Typical of species, mites, thinning canopy, neglect	OK	6	1
12	64	<i>Emerald green</i>	6	4	Typical of species, mites, thinning canopy, neglect	OK	6	1
13	65	<i>Filbert</i>	Clump	-	Typical of species	Excellent	6	1
14	66	<i>Douglas fir</i>	40	20	Lower 12qcovered in dense ivy	Good	30	16
15	67	<i>Douglas fir</i>	18	12	Abnormal shedding bark, dead wood, dead twigs	OK	16	5
16	68	<i>Filbert</i>	Clump	-	Typical of species	Excellent	6	1
17	69	<i>Filbert</i>	Clump	-	Typical of species	Excellent	6	1
18	70	<i>Douglas fir</i>	18	15	Covered with ivy, dead wood, previous top failure	OK	18	5
19	71	<i>Western red cedar</i>	30	10	Asymmetric canopy, growing a few inches from Douglas fir #72	Fair	20	11
20	72	<i>Douglas fir</i>	22	10	Abnormal bark, sap, previous top failure	OK	15	7
21	73	<i>Bigleaf maple</i>	14	10	Co-dominant at 20q Typical of species	Excellent	14	3

#	Tag #	Species	DBH (inches)	Dripline (feet)	Comments	Health	Limits of Disturbance	Tree Credits
22	75	<i>Douglas fir</i>	30	12	Covered in thick ivy, sap, crack @3q vertical crack 25q	Poor	20	11
23	76	<i>Douglas fir</i>	30	12	dead wood, previous top failure, epicormic branch formation abnormal bark, stubs, sap	Poor	25	11
24	77	<i>Douglas fir</i>	40	16	Dead wood, popping bark, carpenter ants, shedding bark, sapsucker holes and other bird holes	Poor	25	16
25	78	<i>Douglas fir</i>	18	10	Dogleg, sap, wound oozing sap, probable red ring rot, popping bark	Poor	15	5
26	79	<i>Western red cedar</i>	13	10	These cedars are growing in tight quarters and likely rely on each other for support, they should remain together, individually they all have asymmetric crowns	Good	13	2.5
27	80	<i>Western red cedar</i>	12	10		Good	13	2
28	81	<i>Western red cedar</i>	12	10		Good	13	2
29	82	<i>Western red cedar</i>	13	10		Good	13	2.5
30	untagged	<i>Filbert</i>	17 Clumps	6		Excellent	6	17

Total Tree Credits	149

**Offsite trees:**

#	Tag #	Species	DBH (inches)	Dripline (feet)	Comments	Health	Limit of Disturbance
1	448	<i>Red alder</i>	16	10	Decay throughout, non-corrected lean to east, several large cavities of decay likely from previous leaders, asymmetric canopy	Poor	16
2	449	<i>Hinoki cypress</i>	6	6	No structural defects	Excellent	6
3	450	<i>White willow</i>	14/8/12/14/10/10/7=29	20	Typical of species	Good	20
4	452	<i>Leylandii cypress</i>	13	8	Typical of species	Excellent	8
5	453	<i>Leylandii cypress</i>	10	8	Typical of species	Excellent	8
6	454	<i>Leylandii cypress</i>	8	8	Typical of species	Excellent	8
7	455	<i>Leylandii cypress</i>	10	8	Typical of species	Excellent	8
8	456	<i>Leylandii cypress</i>	8	8	Typical of species	Excellent	8
9	457	<i>Leylandii cypress</i>	9	8	Typical of species	Excellent	8
10	74	<i>Bigleaf maple</i>	22	10	Lions-tailed pruning, horizontal crack at 3q in plane of lean to east	Fair	22
11	84	<i>Bigleaf maple</i>	34	15	Typical of species	Excellent	20
12	85	<i>Bigleaf maple</i>	9	12	Typical of species	Excellent	12
13	467	<i>Leylandii cypress</i>	6	6	Typical of species	Excellent	8
14	468	<i>Leylandii cypress</i>	7	6	Typical of species	Excellent	8
15	199	<i>Leylandii cypress</i>	6.5	6	Typical of species	Excellent	8
16	58	<i>Leylandii cypress</i>	9.5	6	Typical of species	Excellent	8
17	59	<i>Leylandii cypress</i>	8	6	Typical of species	Excellent	8
18	60	<i>Emerald green</i>	6/8/5=10	4	Typical of species, mites, some stress cones	Good	8
19	61	<i>Emerald green</i>	6/5/3/4=9	4	Typical of species, mites, stress cones	Good	8
20	62	<i>Emerald green</i>	5/4/3=7	4	Typical of species, mites, thinning canopy, neglect	OK	8

**Site map (see attached):****Discussion/Calculations/Conclusion:**

#451 is an apple growing in the lawn area, it is typical of its species for this age especially after poor pruning, and there are multiple leaders with included bark and decay at the branch/scaffold junctions. Poor pruning has left decaying stubs. It could be visually improved with proper pruning

#461 is a 41+ Western red cedar with a column of decay on the north side of the tree; probing indicated the decay to be approximately 12+ deep. Crown and root crown are healthy. Tree is typical for the species and condition assessed as %good+.

##458-460, 462-466 All Leylandii cypress in excellent condition.

#63-64 are Emerald green arborvitae (*Thuja occidentalis*) with DBH of 6+. There have mites, drought stressed and have split leaders, but are in overall OK health.

#65, 68, 69 + 17 untagged clumps are filbert shrubs. These are all typical of their species when healthy; multi-stalked, good foliage, no dead wood. They are in excellent condition.

#66 is a co-dominant Douglas fir with a 40+ DBH. It is covered with ivy making it difficult to thoroughly assess, however, there was a healthy crown, no dead wood, and root crown didn't have indications of decay. It is in %good+ condition.

#67 is also a co-dominant 18+ diameter Douglas fir. It has abnormal shedding bark, dead wood and dead twigs. It is rated in OK condition.

#70 is a co-dominant Douglas fir with a DBH of 18, it is covered with ivy, has dead wood and a previous top failure. It is in OK condition.

#71 is a 30+ Western red cedar in OK condition growing a few inches from Tree #72, a 22+ Douglas fir. The growing conditions has contributed to both having an asymmetric canopy. The fir also has abnormal bark, some free flowing sap and a previous top failure. Together they are in OK health.

#73 is a Bigleaf maple with a co-dominant leader @ 20q It is in excellent condition.

#74 is a Bigleaf maple with a 22+ DBH. It has been pruned into a lions tail shape, which has likely contributed to the horizontal crack at 3q on the west side. This tree should probably be removed to shorten to a habitat tree.

#75 is a 30+ Douglas fir in poor condition. The trunk is covered with ivy, and there are areas of profuse sap indicating a crack or disease process. There is a horizontal crack visually at 3q and a long vertical torque crack from about 25q downward. The tree should be shortened to a habitat.

#76 is a Douglas fir with a DBH of 30+. It is assessed as being in poor condition. It has dead wood, a previous top failure, epicormic branch formation, abnormal bark, stubs, and free flowing sap. . Remove or make a habitat tree-

#77 is a Douglas fir with a 40+ DBH. It has dead wood abnormal popping bark, shedding bark, carpenter ants, sap and bird holes. Shorten or remove.

#78 is a Douglas fir with a dogleg, free flowing sap, an unhealed wound with a large collection of sap indicative of red ring rot. Tree has popping bark indicating decay.

#79-82 is a cluster of close growing Western red cedars with diameters ranging between 12 and 13+. Apart from the asymmetric canopies from their site conditions they are in excellent

#84 and #85 are Bigleaf maples in excellent health.

#### **Off-site trees:**



## Specific Tree Protection Suggestions

### Tree Protection

Tree protection fencing must remain at the limit of disturbance and tree protection specifications must be observed throughout all phases of construction. Fencing is the first item to be addressed prior to grading, and the last item to be removed after construction is completed.

### Tree Protection Specifications

Critical Root Zone and Fencing:

First, protect roots that lie in the path of construction. Approximately 90 to 95 percent of a tree's root system is in the top three feet of soil, and more than half is in the top one foot. Construction activities should be avoided in this area. Protect as much of the area beyond the tree's dripline as possible. Some healthy trees survive after losing half of their roots. However, other species are extremely sensitive to root damage even outside the dripline.

Do not disturb the Critical Root Zone (CRZ). The CRZ is defined by its "critical root radius." It is more accurate than the dripline for determining the CRZ of trees growing in forests or that have narrow growth habits. To calculate critical root radius, measure the tree's diameter (DBH) in inches, 4.5 feet above the ground. For each inch, allow for 1 to 1.5 feet of critical root radius. If a tree's DBH is ten inches, its critical root radius is 10 to 15 feet.

In addition to the CRZ, it is important to determine the Limits of Disturbance (LOD) for preserved trees. Generally this approximates the CRZ however in previously excavated areas around the dripline the LOD may be smaller, or in the case of a tree situated on a slope the LOD may be larger. The determination of LOD is also subject to the particular tree species. Some tree species do better than others after root disturbance. Tree protection is advised throughout the duration of any construction activities whenever the critical root zone or leaf canopy may be encroached upon by such activities.

The Critical Root Zone (CRZ) or LOD should be protected with fencing adequate to hinder access to people vehicles and equipment. Fencing detail is provided. It should consist of continuous 4 ft high temporary chain-link fencing with posts set at 10 foot center or polyethylene laminar safety fencing or similar. The fencing must contain fencing signage detailing that the tree protection area cannot be trespassed on.

Soil compaction is one of the most common killers of urban trees. Stockpiled materials, heavy machinery and excessive foot traffic damage soil structure and reduce soil pore space. The affected tree roots suffocate. When construction takes place close to the protected CRZ, cover the site with 4 inches of bark to reduce soil compaction.

Tree Protection fencing must be erected prior to soil excavation, boring, grading or fill operations. It is erected at the LOD. If it is necessary to run utilities within the LOD, the utilities should be combined into one cut, as practical. Trenching is not allowed in the LOD. In these areas boring or tunneling techniques should be used. In the event that roots greater than 1+ diameter near the LOD are damaged or torn, it is necessary to hand trim them to a clean cut. Any roots that are exposed during construction should be covered with soil as soon as possible.

During drought conditions, trees must be adequately watered. Site should be visited regularly by a qualified ISA Certified Arborist to ensure the health of the trees. Tree protection fencing is the last item to be removed from the site after construction is completed. After construction has been completed, evaluate the remaining trees. Look for signs and symptoms of damage or stress. It may take several years for severe problems to appear.

In the event that fencing around portions of the CRZ of a tree to be retained are not practical to erect due to construction or obstacles, tree protection fencing should be placed three feet laterally from the obstruction (ex. three feet back of a curb, building, or other existing or planned permanent infrastructure).

Tree trunk protection is required where CRZ fencing is not practical. Tree trunks should be wrapped in pine 2X4s and accessible critical structural root zones covered with wooden pallets.

**Specific Tree Retention Detail:**

<http://www.kirklandwa.gov/Assets/Planning/Planning+PDFs/Trees/Tree+Fencing+Detail.pdf>

### **Assumptions and Limiting Conditions**

1. Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownerships to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised or evaluated as though free and clear, under responsible ownership and competent management.
2. It is assumed that any property is not in violation of any applicable codes, ordinances, statutes or other governmental regulations.
3. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.
4. The consultant/appraiser shall not be required to give testimony or to attend court by reason of the report unless subsequent contractual arrangements are made including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
5. Loss or alteration of any part of this report invalidates the entire report.
6. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.
7. Neither all nor any part of the contents of the report, nor copy thereof, shall be conveyed by anyone, including the client to the public through advertising, public relations, news, sales or other media, without the prior expressed written or verbal consent of the consultant/appraiser . particularly as to value conclusions, identity of the consultant/appraiser, or any reference to any professional society or institute or to any initialed designation conferred upon the consultant/appraiser as stated in her qualification.
8. The report and any values expressed herein represent the opinion of the consultant/appraiser, and the consultant/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of subsequent event, nor upon any finding to be reported.
9. Sketches, diagrams, graphs and photographs in this report, being intended as visual aid, are not necessarily to scale and should not be construed as engineering or architectural reports or survey.
10. Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2: the inspection is limited to visual examination of accessible items without dissection, excavation, probing or coring. There is not warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.